

Claims:

1. A multi-dosage liquid pharmaceutical formulation of human growth hormone consisting essentially of human growth hormone at a concentration of from about 5 mg/ml to about 100 mg/ml, phenol, an aqueous buffer, a non-ionic surfactant, said pharmaceutical formulation having a tonicity of from about 100 mosm/kg to about 500 mosm/kg, having a pH of from about 6.1 to about 6.3, and being substantially free of an amino acid excipient.
2. The pharmaceutical composition according to claim 1, additionally comprising a tonicity-adjusting agent such that the tonicity of the pharmaceutical composition is from about 100 mosm/kg to about 500 mosm/kg.
3. The pharmaceutical formulation according to claim 1 or claim 2, wherein the concentration of human growth hormone is from about 6 mg/ml to about 14 mg/ml.
4. The pharmaceutical formulation according to claim 1 or claim 2, wherein the concentration of human growth hormone is about 6.67 mg/ml.
5. The pharmaceutical formulation according to claim 1 or claim 2, wherein the concentration of phenol is from about 2 mg/ml to about 5 mg/ml.
6. The pharmaceutical formulation according to claim 1 or claim 2, wherein the concentration of phenol is about 2.5 mg/ml.
7. The pharmaceutical formulation according to claim 1 or claim 2, wherein the buffer is selected from the group consisting of a phosphate buffer, a citrate buffer, an acetate buffer and a formate buffer.
8. The pharmaceutical formulation according to claim 1 or claim 2, wherein the aqueous buffer is a phosphate buffer.
9. The pharmaceutical formulation according to claim 1 or claim 2, wherein the buffer has a concentration of from about 5 mM to about 100 mM.

10. The pharmaceutical formulation according to claim 1 or claim 2, wherein the buffer has a concentration of about 10 mM.
11. The pharmaceutical formulation according to claim 1 or claim 2, wherein the buffer is a phosphate buffer having a concentration of about 10 mM.
12. The pharmaceutical formulation according to claim 1 or claim 2, wherein the non-ionic surfactant is selected from the group consisting of a poloxamer and a polysorbate.
13. The pharmaceutical formulation according to claim 1 or claim 2, wherein the non-ionic surfactant is a poloxamer.
14. The pharmaceutical formulation according to claim 1 or claim 2, wherein the non-ionic surfactant is poloxamer 188.
15. The pharmaceutical formulation according to claim 1 or claim 2, wherein the non-ionic surfactant is present at a concentration of from about 0.05 to about 4 mg/ml.
16. The pharmaceutical composition according to claim 1 or claim 2, wherein the non-ionic surfactant is present at a concentration of about 2 mg/ml.
17. The pharmaceutical composition according to claim 1 or claim 2, wherein the non-ionic surfactant is poloxamer 188 being present at a concentration of about 2 mg/ml.
18. The pharmaceutical formulation according to claim 2, wherein the tonicity-adjusting agent is selected from the group consisting of a sugar, a sugar alcohol, a polyol and a neutral salt.
19. The pharmaceutical formulation according to claim 17, wherein the tonicity-adjusting agent is mannitol.
20. The pharmaceutical formulation according to claim 17, wherein the tonicity-adjusting agent is present at a concentration of up to 70 mg/ml.

21. The pharmaceutical formulation according to claim 17, wherein the tonicity-adjusting agent is mannitol being present at a concentration of about 30 mg/ml.

22. The pharmaceutical formulation according to claim 1 or claim 2, said pharmaceutical composition being substantially isotonic.

23. The pharmaceutical formulation according to claim 1 or claim 2, said pharmaceutical composition having a pH of about 6.2.

24. The pharmaceutical composition according to claim 2, essentially consisting of

6.67 mg/ml human growth hormone,

2.5 mg/ml phenol,

10 mM sodium phosphate buffer,

30 mg/ml mannitol,

2 mg/ml poloxamer 188,

and having a pH of 6.2.

25. A kit comprising an injection device and a separate container containing a multi-dosage liquid formulation of human growth hormone according to claim 1 or claim 2.